

Flats come in various forms and sizes. A flat is a fake wall. If you look around you, you will see walls that are solid, usually made out of wood or plaster, and go from floor to ceiling. Some walls have holes in them. A door is a hole in the wall. So is a window.

How to build a flat. Let me start at the beginning.

What is a flat? It's a fake wall. It can be any size you wish. Look at a wall in the room you are in now. What size is it? Most likely it's between 8 and 10 feet tall and maybe 8 to 16 feet wide. Well, your flat could be this size or bigger. Here's the catch. Once you've built this huge flat, will it fit through the door? Most flats are built in one of two different styles. Hard and Soft. Hard flats are covered with a thin plywood and soft flats are covered with cloth. We'll talk about the actual [materials](#) later. The cloth flats are much lighter and easier to handle, however, they appear a bit less like hard walls than plywood covered flats. The hard flats tend to act like real walls. If you have a small theater and the audience sits close to the set, hard is the way to go. How to build... Soft flats can, as mentioned before, be made to almost any size. Hard flats are more limited. most are built to the size of the plywood. Plywood comes in 4x8 foot sheets. Therefore, the standard size hard stock flat is 4x8 feet. So, let's start with building hard flats. First, let draw a "technical" drawing of our flat. It's best to draw these in some sort of scale. I take a ruler and draw a rectangle 4 inches by 8 inches. Yes, each inch will equal one foot in real size. This is called 1" scale. Or 1"=1'0". Now we add lines to represent the 1x3 lumber. In one inch scale, this would be just shy of 1/4" wide. . First we need to draw a plan.

SOFT AND HARD FLATS

Hard covered theatrical flat. Much like the soft flat in it's framing, this flat offers a more sturdy wall surface. If actors are going to be brushing upon the walls, a hard flat is called for.



Soft covered theatrical flat. This flat is framed flat and covered with muslin. The framing is usually 1"x3" pine laid flat and the joints are held together with key stones and corner blocks.

The muslin is glued, stapled and then sized. This photo shows the methods of building a flat, however, you'll notice the size doesn't look right. It's not. this flat is 2 feet square.



All the parts of a flat have a name. Top & Bottom Rails, A toggle in the middle and a Stile on either side. Each corner is held together with a corner block and the middle toggle is attached with a keystone on each end.

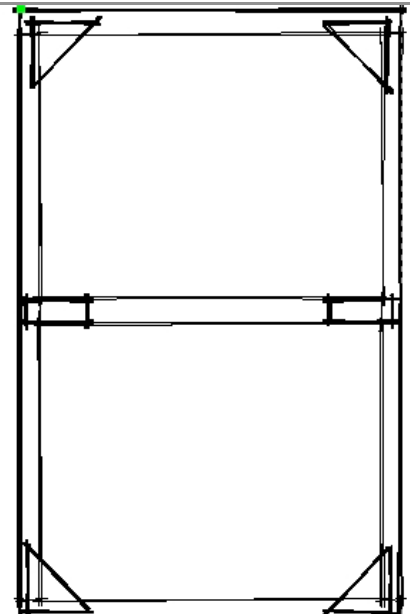


Next step is sizing. Sizing is a powdered substance, which is mixed with water, and then applied with a brush to the muslin of your flat. Sizing tightens the muslin of your flat, while also giving one an impermeable substance so one can paint on it. Instead of sizing it is also possible to use watered down paint. Basically the way one uses sizing is to take a brush and apply, either the watered-down paint, or the sizing mixed with water, to the muslin and when finished let it dry.



Hard covered, Hollywood flat. This flat has the 1"x3" framing framed "on-edge." This flat takes up a few more inches in storage but is easier to attach to the flat next to it.

The joints are held together with pieces of wood called keystones or corner blocks. Corner blocks are used to hold the bottom rail, top rail, and both styles in place. Keystones are used to hold the toggle in place. Corner blocks and keystones are glued and nailed to the framing. Due to the manner in which flats are used, the corner blocks and keystones have to be a certain distance away from the edge of the flat. For hard covered flats, flats covered with plywood (usually 1/4"), the distance from the edge should usually be 1". For soft covered flat, flats that are covered with muslin., should usually be 3/4". Corner block and keystones have to be placed a width away from the edge so that flats can be joint together at right angles, and the outside could be even.



Flats are usually made in the proportions of 1:2. The most common flats are 4 feet wide and stand 8 feet tall. They are normally framed with 1" X 3" pine laid flat. The actual dimensions of 1" X 3" are 3/4" X 2 1/2"

Hard Covers are usually made from 1/4" plywood or sometimes 1/8" plywood. The hard flat offers a sturdy wall surface ideal if actors are going to be brushing against the walls.

Soft covers are usually made from a cloth called muslin. To cover your flat staple muslin to one edge of the flat. Glue the width the frame on that side. Then stretch the muslin to the other end and staple it tight. Do the same to the remaining two sides.

After the muslin had been stretched onto the flat wait for the glue to dry. you can then either cut the excess muslin and leave the staples or remove the staples and cut off all muslin other than that on the surface of the flat.

CURVED FLATS

The Tower Tops for Once Upon A Mattress.

Well, these aren't really flats per-se'. But the method is the same. You will need to make a curved inner structure and then cover that with strips of wood forming ribs. This all will get covered with whatever covering you wish to use



Here we're using cardboard. We chose cardboard because it would add to the desired wood shingle look we were trying to achieve. Using muslin would have been a lot easier as the cloth would have formed well to the shape of the framing. The cardboard didn't want to take the curved shape and kept popping the staples. We had to switch to the longest staples we could find.



To get the smoothest surface possible will require using more ribs. Each rib will, most likely, show through the covering.

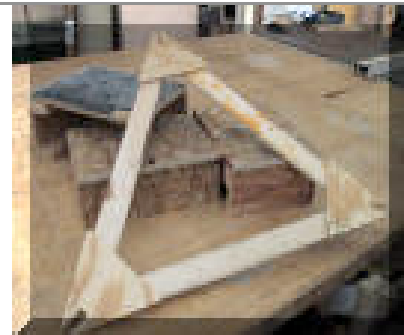


PERIAKTOI

A Periaktoi is an ancient device, often thought to be of Greek origin, that is still used for stage scene changes. It is usually a triangular unit with (3) equal sides. Each side can have a different scene painted on it. When using more than one* Periaktoi in a row, it can look like a solid wall. When all the units are rotated to the second or third side, it reveals another scene. One of the most well known shows to currently use Periaktoi is "A Chorus Line." *Periaktoi is actually a plural term.

Here is a drawing for our current production of Mame. We will be building 6 Periaktoi columns. Check back as I am taking pictures of the process. 03/06/03...

Our Periaktoi frames are built using plywood tops and bottoms. The middle triangles are custom built from scrap plywood and 1x3 furring strips. The notch is for the 1x4 pine boards that will stand the unit up. We've ordered the lumber at 10 feet.



The verticals are placed in the notch and then a couple of brads are air nailed into the plywood, through the 1x4 and into the other side of the notch. This virtually locks the piece together.



Remember to nail the thinner material into the thicker. In other words, we used 1/2" ply for the little triangles and we're nailing through the ply into the 1x3 stock. The staple gets more wood to bite into. Don't forget the glue!!!



Since we had to build 12 triangles, we made a jig. I took one of the regular plywood triangles, attached a small piece of ply on each side of the point. Then, we placed the little triangles atop the 1x3 and pushed it into place. Then stapled. Doing it this way made sure that each was the same. I'm sure you've run into a situation where you've tried to nail something in place where the thing you were trying to line up is on the bottom.



These hollow triangles serve more than just the money saving purpose. If the middle triangles were solid, we wouldn't be able to add the diagonal bracing. Since these units will be soft covered, we need to add the bracing on the inside



Setting the diagonal bracing properly is difficult. Getting the frame to be square, but in a triangle is tricky. I'll post how we did this after we figure out how!



We figured it out. how to get these thing to be square before nailing in the diagonal bracing. Looking at the picture, you'll see two red boxes. These are some of our practice cubes. They are already square. We placed one at each end. Clamped the ends to the boxes and screwed the boxes to the table. The side of the Periaktoi is butted up against some wood screwed into the side of the table.



A forest of Periaktoi. Three units are done and they are taller than the shop lights.



Laying out the muslin for cutting. This bunch is 9 feet wide by several yards long. I tend to buy damaged muslin from RoseBrand in NYC. The damaged goods end up being half price from the new stuff. The damage? just a few stains. Since we're painting the muslin, we don't care about a few stains...

We laid the muslin out on our work table. Then we placed the frame on top, pulled the muslin up and stapled the edge to the wood.



Before stapling, we ran a bead of glue along the wood edge. While stapling, we pushed the muslin down into the glue to be sure of a good bond.







Team work is very effective at this point. We don't want the glue to dry before the muslin gets stapled.

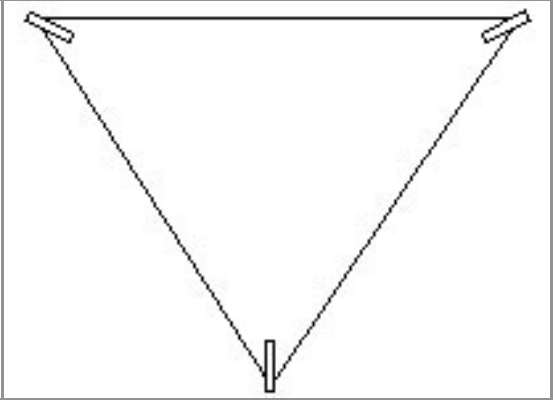


These things ended up looking pretty good. Nice and tight muslin covering is very important to give the unit clean lines and a smooth surface. We still need to size the covering with watered down paint.



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| <p>Here we have three of the units standing side by side. Standing like this, they form a wall. Though our design doesn't call for these to be up against each other, we could paint each side to match. This would give us three solid walls of our choosing.</p> |  |
| <p>The rear view of our set of three Periaktoi. Our next steps include: sizing, mounting on turn tables and placing them all on platforms.</p> |  |
| <p>We're sizing the muslin with watered down paint. I like using a 1 to 1 ratio. That's half paint and half water. We use any color that we have too much of.</p> |  |
| <p>We're working on placing rotating bases on the units.</p> | |
| <p>The turntables need to be installed using a small access hole. This hole lines up with an access hole on the lazy Susan.</p> | |
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| <p>Safety glasses please!</p> | |
| <p>A Periaktoi is a triangular unit which is often made by one of two methods. The method you see here was via building a frame with three styles held together by three triangular pieces of 1/2" ply. One at the top and bottom with the third at the center.</p> |  |

This is a ground plan (top) view of one of the triangular pieces of ply with the 1"x3" furring strips inserted into each corner. Notice that if you were to draw a line from the very outside edge of the 1"x3"s, that line will not touch the plywood. When we cover the unit with muslin, the muslin will not touch the plywood. Thus concealing the framing. It will look just like a soft covered flat.



This is simply a side view of the assembled Periaktoi. Depending on the height of the unit, you can insert as many 1/4" ply frames as you need. Why Might you need more 1/4" ply braces? Think about what happens when you size the muslin. As the sizing dries, it shrinks. You don't want the open sections of 1"x3" to bow in. You'd end up with a big hour glass.

